

**C1**

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## Questions & Answers

Time : 3 hrs. 20 Min.

*for*

M.M. : 720

# Re-Examination of NEET (UG)-2024

### Important Instructions:

1. The test is of **3 hours 20 minutes** duration and the Test Booklet contains **200** multiple-choice questions (four options with a single correct answer) from **Physics, Chemistry and Biology (Botany and Zoology)**. 50 questions in each subject are divided into **two Sections (A and B)** as per details given below:
  - (a) **Section-A** shall consist of **35 (Thirty-five)** Questions in each subject (Question Nos-1 to 35, 51 to 85, 101 to 135 and 151 to 185). All Questions are compulsory.
  - (b) **Section-B** shall consist of **15 (Fifteen)** questions in each subject (Question Nos- 36 to 50, 86 to 100, 136 to 150 and 186 to 200). In **Section B**, a candidate needs to **attempt any 10 (Ten)** questions out of **15 (Fifteen)** in each subject.  
**Candidates are advised to read all 15 questions in each subject of Section B** before they start attempting the question paper. In the event of a candidate attempting more than ten questions, **the first ten questions answered by the candidate shall be evaluated.**
2. Each question carries **4 marks**. For each correct response, the candidate will get **4 marks**. For each incorrect response, **one mark** will be deducted from the total scores. **The maximum marks are 720.**
3. Use **Blue / Black Ball Point Pen only** for writing particulars on this page / marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must **hand over the Answer Sheet (ORIGINAL and OFFICE copy) to the Invigilator** before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. **The CODE for this Booklet is C1. Make sure that the CODE printed on the Original Copy of the Answer Sheet is the same as that on this Test Booklet.** In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer sheet.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
9. Each candidate must show on-demand his/her Admission Card to the Invigilator.
10. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
11. Use of Electronic/Manual Calculator is prohibited.
12. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Room / Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
13. **No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.**
14. The candidates will write the Correct Test Booklet Code as given in the Test Booklet / Answer Sheet in the Attendance Sheet.

**PHYSICS**

**SECTION-A**

1. The magnetic potential energy, when a magnetic bar of magnetic moment  $\vec{m}$  is placed perpendicular to the magnetic field  $\vec{B}$  is

- (1)  $-\frac{mB}{2}$  (2) Zero  
(3)  $-mB$  (4)  $mB$

**Answer (2)**

2. A bob is whirled in a horizontal circle by means of a string at an initial speed of 10 rpm. If the tension in the string is quadrupled while keeping the radius constant, the new speed is:

- (1) 20 rpm (2) 40 rpm  
(3) 5 rpm (4) 10 rpm

**Answer (1)**

3. A metal cube of side 5 cm is charged with 6  $\mu\text{C}$ . The surface charge density on the cube is

- (1)  $0.125 \times 10^{-3} \text{ C m}^{-2}$  (2)  $0.25 \times 10^{-3} \text{ C m}^{-2}$   
(3)  $4 \times 10^{-3} \text{ C m}^{-2}$  (4)  $0.4 \times 10^{-3} \text{ C m}^{-2}$

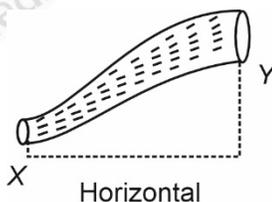
**Answer (4)**

4. The incorrect relation for a diamagnetic material (all the symbols carry their usual meaning and  $\epsilon$  is a small positive number) is:

- (1)  $\mu < \mu_0$  (2)  $0 \leq \mu_r < 1$   
(3)  $-1 \leq \chi < 0$  (4)  $1 < \mu_r < 1 + \epsilon$

**Answer (4)**

5. An ideal fluid is flowing in a non-uniform cross-sectional tube XY (as shown in the figure) from end X to end Y. If  $K_1$  and  $K_2$  are the kinetic energy per unit volume of the fluid at X and Y respectively, then the correct option is :



- (1)  $K_1 = K_2$  (2)  $2K_1 = K_2$   
(3)  $K_1 > K_2$  (4)  $K_1 < K_2$

**Answer (3)**

6. The escape velocity for earth is  $v$ . A planet having 9 times mass that of earth and radius, 16 times that of earth, has the escape velocity of:

- (1)  $\frac{v}{3}$  (2)  $\frac{2v}{3}$   
(3)  $\frac{3v}{4}$  (4)  $\frac{9v}{4}$

**Answer (3)**

7. An electron and an alpha particle are accelerated by the same potential difference. Let  $\lambda_e$  and  $\lambda_\alpha$  denote the de-Broglie wavelengths of the electron and the alpha particle, respectively, then:

- (1)  $\lambda_e > \lambda_\alpha$  (2)  $\lambda_e = 4\lambda_\alpha$   
 (3)  $\lambda_e = \lambda_\alpha$  (4)  $\lambda_e < \lambda_\alpha$

**Answer (1)**

8. An object moving along horizontal x-direction with kinetic energy 10 J is displaced through  $x = (3\hat{i})$  m by the force  $\vec{F} = (-2\hat{i} + 3\hat{j})$  N. The kinetic energy of the object at the end of the displacement x is

- (1) 10 J (2) 16 J  
 (3) 4 J (4) 6 J

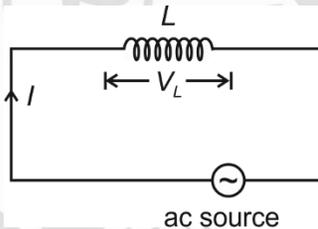
**Answer (3)**

9. An object falls from a height of 10 m above the ground. After striking the ground it loses 50% of its kinetic energy. The height upto which the object can rebound from the ground is:

- (1) 7.5 m (2) 10 m  
 (3) 2.5 m (4) 5 m

**Answer (4)**

10. In the circuit shown below, the inductance  $L$  is connected to an ac source. The current flowing in the circuit is  $I = I_0 \sin \omega t$ . The voltage drop ( $V_L$ ) across  $L$  is



- (1)  $\omega L I_0 \sin \omega t$  (2)  $\frac{I_0}{\omega L} \sin \omega t$   
 (3)  $\frac{I_0}{\omega L} \cos \omega t$  (4)  $\omega L I_0 \cos \omega t$

**Answer (4)**

11. A 12 pF capacitor is connected to a 50 V battery, the electrostatic energy stored in the capacitor in nJ is

- (1) 15 (2) 7.5  
 (3) 0.3 (4) 150

**Answer (1)**

12. A uniform wire of diameter  $d$  carries a current of 100 mA when the mean drift velocity of electrons in the wire is  $v$ . For a wire of diameter  $\frac{d}{2}$  of the same material to carry a current of 200 mA, the mean drift velocity of electrons in the wire is

- (1)  $4v$  (2)  $8v$   
 (3)  $v$  (4)  $2v$

**Answer (2)**

13. In an electrical circuit, the voltage is measured as  $V = (200 \pm 4)$  volt and the current is measured as  $I = (20 \pm 0.2)$  A. The value of the resistance is:

- (1)  $(10 \pm 4.2) \Omega$  (2)  $(10 \pm 0.3) \Omega$   
 (3)  $(10 \pm 0.1) \Omega$  (4)  $(10 \pm 0.8) \Omega$

**Answer (2)**

14. A step up transformer is connected to an ac mains supply of 220 V to operate at 11000 V, 88 watt. The current in the secondary circuit, ignoring the power loss in the transformer, is

- (1) 8 mA (2) 4 mA  
 (3) 0.4 A (4) 4 A

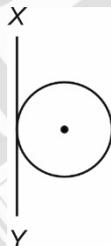
**Answer (1)**

15. A particle is moving along x-axis with its position ( $x$ ) varying with time ( $t$ ) as  $x = \alpha t^4 + \beta t^2 + \gamma t + \delta$ . The ratio of its initial velocity to its initial acceleration, respectively, is:

- (1)  $2\alpha : \delta$  (2)  $\gamma : 2\delta$   
 (3)  $4\alpha : \beta$  (4)  $\gamma : 2\beta$

**Answer (4)**

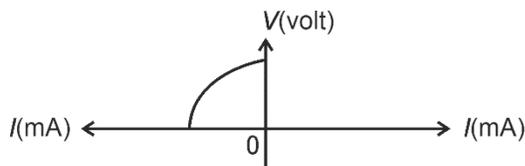
16. The radius of gyration of a solid sphere of mass 5 kg about XY is 5 m as shown in figure. The radius of the sphere  $\frac{5x}{\sqrt{7}}$  m, then the value of  $x$  is:



- (1) 5 (2)  $\sqrt{2}$   
 (3)  $\sqrt{3}$  (4)  $\sqrt{5}$

**Answer (4)**

17.



The I-V characteristics shown above are exhibited by a:

- (1) Light emitting diode  
 (2) Zener diode  
 (3) Photodiode  
 (4) Solar cell

**Answer (4)**



23. Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A:** Houses made of concrete roofs overlaid with foam keep the room hotter during summer.

**Reason R:** The layer of foam insulation prohibits heat transfer, as it contains air pockets.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) **A** is true but **R** is false.  
 (2) **A** is false but **R** is true.  
 (3) Both **A** and **R** are true and **R** is the correct explanation of **A**.  
 (4) Both **A** and **R** true but **R** is NOT the correct explanation of **A**.

**Answer (2)**

24. A particle executing simple harmonic motion with amplitude  $A$  has the same potential and kinetic energies at the displacement

- (1)  $2\sqrt{A}$  (2)  $\frac{A}{2}$   
 (3)  $\frac{A}{\sqrt{2}}$  (4)  $A\sqrt{2}$

**Answer (3)**

25. Two slits in Young's double slit experiment are 1.5 mm apart and the screen is placed at a distance of 1 m from the slits. If the wavelength of light used is  $600 \times 10^{-9}$  m then the fringe separation is

- (1)  $4 \times 10^{-5}$  m (2)  $9 \times 10^{-8}$  m  
 (3)  $4 \times 10^{-7}$  m (4)  $4 \times 10^{-4}$  m

**Answer (4)**

26. Water is used as a coolant in a nuclear reactor because of its

- (1) high thermal expansion coefficient (2) high specific heat capacity  
 (3) low density (4) low boiling point

**Answer (2)**

27. The pitch of an error free screw gauge is 1 mm and there are 100 divisions on the circular scale. While measuring the diameter of a thick wire, the pitch scale reads 1 mm and 63<sup>rd</sup> division on the circular scale coincides with the reference line. The diameter of the wire is:

- (1) 1.63 cm (2) 0.163 cm  
 (3) 0.163 m (4) 1.63 m

**Answer (2)**

28. Let us consider two solenoids  $A$  and  $B$ , made from same magnetic material of relative permeability  $\mu_r$  and equal area of cross-section. Length of  $A$  is twice that of  $B$  and the number of turns per unit length in  $A$  is half that of  $B$ . The ratio of self inductances of the two solenoids,  $L_A : L_B$  is

- (1) 1 : 2 (2) 2 : 1  
 (3) 8 : 1 (4) 1 : 8

**Answer (1)**

29. When the output of an OR gate is applied as input to a NOT gate, then the combination acts as a
- (1) NAND gate (2) NOR gate  
(3) AND gate (4) OR gate

**Answer (2)**

30. Interference pattern can be observed due to superposition of the following waves:

- A.  $y = a \sin \omega t$  B.  $y = a \sin 2\omega t$   
C.  $y = a \sin(\omega t - \phi)$  D.  $y = a \sin 3\omega t$

Choose the **correct** answer from the options given below.

- (1) B and C (2) B and D  
(3) A and C (4) A and B

**Answer (3)**

31. If  $\phi$  is the work function of photosensitive material in eV and light of wavelength of numerical value  $\lambda = \frac{hc}{e}$  metre, is incident on it with energy above its threshold value at an instant then the maximum kinetic energy of the photo-electron ejected by it at that instant (Take  $h$ -Planck's constant,  $c$ -velocity of light in free space) is (in SI units):

- (1)  $e + 2\phi$  (2)  $2e - \phi$   
(3)  $e - \phi$  (4)  $e + \phi$

**Answer (3)**

32. The electromagnetic radiation which has the smallest wavelength are
- (1) X-rays (2) Gamma rays  
(3) Ultraviolet rays (4) Microwaves

**Answer (2)**

33. The equilibrium state of a thermodynamic system is described by

- A. Pressure  
B. Total heat  
C. Temperature  
D. Volume  
E. Work done

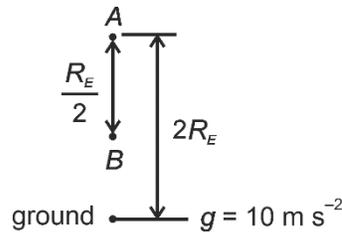
Choose the **most appropriate** answer from the options given below.

- (1) A, B and E only  
(2) B, C and D only  
(3) A, B and C only  
(4) A, C and D only

**Answer (4)**



39. An object of mass 100 kg falls from point A to B as shown in figure. The change in its weight, corrected to the nearest integer is ( $R_E$  is the radius of the earth):



- (1) 49 N (2) 89 N  
(3) 5 N (4) 10 N

**Answer (1)**

40. The potential energy of a particle moving along x-direction varies as  $V = \frac{Ax^2}{\sqrt{x+B}}$ . The dimensions of  $\frac{A^2}{B}$  are:

- (1)  $[M^{3/2} L^{1/2} T^{-3}]$  (2)  $[M^{1/2} L T^{-3}]$   
(3)  $[M^2 L^{1/2} T^{-4}]$  (4)  $[ML^2T^{-4}]$

**Answer (3)**

41. The two-dimensional motion of a particle, described by  $\vec{r} = (\hat{i} + 2\hat{j}) A \cos \omega t$  is a/an:

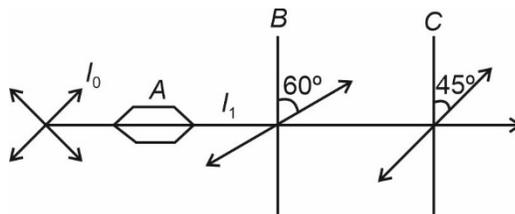
- A. parabolic path  
B. elliptical path  
C. periodic motion  
D. simple harmonic motion

Choose the correct answer from the options given below:

- (1) B, C and D only (2) A, B and C only  
(3) A, C and D only (4) C and D only

**Answer (4)**

42. A beam of unpolarized light of intensity  $I_0$  is passed through a polaroid A, then through another polaroid B, oriented at  $60^\circ$  and finally through another polaroid C, oriented at  $45^\circ$  relative to B as shown. The intensity of emergent light is:



- (1)  $\frac{I_0}{16}$  (2)  $\frac{I_0}{4}$   
(3)  $\frac{I_0}{2}$  (4)  $\frac{I_0}{32}$

**Answer (1)**

43. Select the correct statements among the following :

- A. Slow neutrons can cause fission in  ${}_{92}^{235}\text{U}$  than fast neutrons.
- B.  $\alpha$ -rays are Helium nuclei.
- C.  $\beta$ -rays are fast moving electrons or positrons.
- D.  $\gamma$ -rays are electromagnetic radiations of wavelengths larger than X-rays.

Choose the **most appropriate** answer from the options given below :

- (1) A, B and C only
- (2) A, B and D only
- (3) A and B only
- (4) C and D only

**Answer (1)**

44. Let  $\omega_1$ ,  $\omega_2$  and  $\omega_3$  be the angular speed of the second hand, minute hand and hour hand of a smoothly running analog clock, respectively. If  $x_1$ ,  $x_2$  and  $x_3$  are their respective angular distances in 1 minute then the factor which remains constant ( $k$ ) is

- (1)  $\frac{\omega_1}{x_1} = \frac{\omega_2}{x_2} = \frac{\omega_3}{x_3} = k$
- (2)  $\omega_1 x_1 = \omega_2 x_2 = \omega_3 x_3 = k$
- (3)  $\omega_1 x_1^2 = \omega_2 x_2^2 = \omega_3 x_3^2 = k$
- (4)  $\omega_1^2 x_1 = \omega_2^2 x_2 = \omega_3^2 x_3 = k$

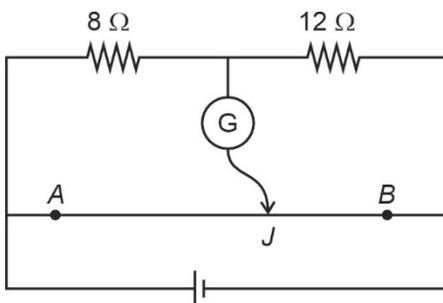
**Answer (1)**

45. The magnetic moment of an iron bar is  $M$ . It is now bent in such a way that it forms an arc section of a circle subtending an angle of  $60^\circ$  at the centre. The magnetic moment of this arc section is

- (1)  $\frac{3M}{\pi}$
- (2)  $\frac{4M}{\pi}$
- (3)  $\frac{M}{\pi}$
- (4)  $\frac{2M}{\pi}$

**Answer (1)**

46. The given circuit shows a uniform straight wire  $AB$  of 40 cm length fixed at both ends. In order to get zero reading in the galvanometer  $G$ , the free end of  $J$  is to be placed from  $B$  at:



- (1) 32 cm
- (2) 8 cm
- (3) 16 cm
- (4) 24 cm

**Answer (4)**

47. According to the law of equipartition of energy, the number of vibrational modes of a polyatomic gas of constant  $\gamma = \frac{C_p}{C_v}$  is ( $C_p$  where  $C_v$  are the specific heat capacities of the gas at constant pressure and constant volume, respectively):

(1)  $\frac{4 + 3\gamma}{\gamma - 1}$

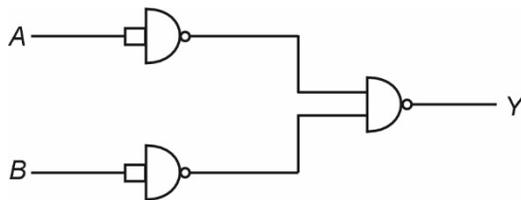
(2)  $\frac{3 + 4\gamma}{\gamma - 1}$

(3)  $\frac{4 - 3\gamma}{\gamma - 1}$

(4)  $\frac{3 - 4\gamma}{\gamma - 1}$

**Answer (3)**

48. The output  $Y$  for the inputs  $A$  and  $B$  of the given logic circuit is :



(1)  $A \cdot B$

(2)  $\bar{A} \cdot \bar{B}$

(3)  $A + B$

(4)  $\bar{A} + \bar{B}$

**Answer (3)**

49. The amplitude of the charge oscillating in a circuit decreases exponentially as  $Q = Q_0 e^{-Rt/2L}$ , where  $Q_0$  is the charge at  $t = 0$ s. The time at which charge amplitude decreases to  $0.50 Q_0$  is nearly:

[Given that  $R = 1.5 \Omega$ ,  $L = 12 \text{ mH}$ ,  $\ln(2) = 0.693$ ]

(1) 19.01 ms

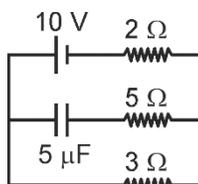
(2) 11.09 ms

(3) 19.01 s

(4) 11.09 s

**Answer (2)**

50. The steady state current in the circuit shown below is :



(1) 0.67 A

(2) 1.5 A

(3) 2 A

(4) 1 A

**Answer (3)**

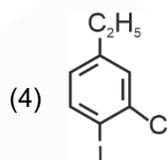
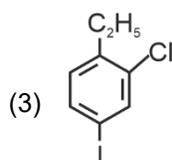
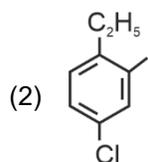
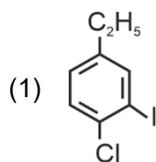
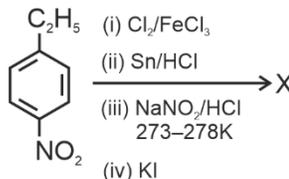


55. Which of the following molecules has "NON ZERO" dipole moment value?

- (1)  $\text{CCl}_4$  (2)  $\text{HI}$   
 (3)  $\text{CO}_2$  (4)  $\text{BF}_3$

**Answer (2)**

56. The major product X formed in the following reaction sequence is:



**Answer (3)**

57. Which indicator is used in the titration of sodium hydroxide against oxalic acid and what is the colour change at the end point?

- (1) Phenolphthalein, pink to yellow  
 (2) Alkaline  $\text{KMnO}_4$ , colourless to pink  
 (3) Phenolphthalein, colourless to pink  
 (4) Methyl orange, yellow to pinkish red colour

**Answer (3)**

58. Match List-I with List-II :

	List-I (Atom/Molecule)		List-II (Property)
A.	Nitrogen atom	I.	Paramagnetic
B.	Fluorine molecule	II.	Most reactive element in group 18
C.	Oxygen molecule	III.	Element with highest ionisation enthalpy in group 15
D.	Xenon atom	IV.	Strongest oxidising agent

Identify the **correct** answer from the options given below :

- (1) A-III, B-I, C-IV, D-II (2) A-I, B-IV, C-III, D-II  
 (3) A-II, B-IV, C-I, D-III (4) A-III, B-IV, C-I, D-II

**Answer (4)**

59. From the following select the one which is **not** an example of corrosion.

- (1) Rusting of iron object
- (2) Production of hydrogen by electrolysis of water
- (3) Tarnishing of silver
- (4) Development of green coating on copper and bronze ornaments

**Answer (2)**

60. Which of the following pairs of ions will have same spin only magnetic moment values within the pair?

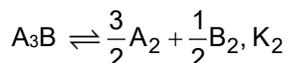
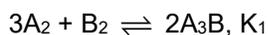
- A.  $Zn^{2+}$ ,  $Ti^{2+}$
- B.  $Cr^{2+}$ ,  $Fe^{2+}$
- C.  $Ti^{3+}$ ,  $Cu^{2+}$
- D.  $V^{2+}$ ,  $Cu^{+}$

Choose the **correct** answer from the options given below :

- (1) C and D only
- (2) A and D only
- (3) A and B only
- (4) B and C only

**Answer (4)**

61. At a given temperature and pressure, the equilibrium constant values for the equilibria are given below:



The relation between  $K_1$  and  $K_2$  is :

- (1)  $K_1^2 = 2K_2$
- (2)  $K_2 = \frac{K_1}{2}$
- (3)  $K_1 = \frac{1}{\sqrt{K_2}}$
- (4)  $K_2 = \frac{1}{\sqrt{K_1}}$

**Answer (4)**

62. Arrange the following compounds in increasing order of their solubilities in chloroform:

NaCl,  $CH_3OH$ , cyclohexane,  $CH_3CN$

- (1)  $NaCl < CH_3CN < CH_3OH < Cyclohexane$
- (2)  $CH_3OH < CH_3CN < NaCl < Cyclohexane$
- (3)  $NaCl < CH_3OH < CH_3CN < Cyclohexane$
- (4)  $Cyclohexane < CH_3CN < CH_3OH < NaCl$

**Answer (1)**

63. Identify the **incorrect** statement about  $PCl_5$ .

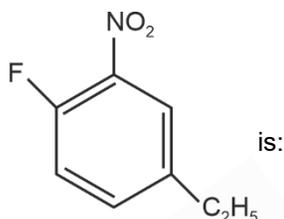
- (1)  $PCl_5$  possesses two different Cl – P – Cl bond angles
- (2) All five P – Cl bonds are identical in length
- (3)  $PCl_5$  exhibits  $sp^3d$  hybridisation
- (4)  $PCl_5$  consists of five P – Cl (sigma) bonds

**Answer (2)**

64. Choose the correct statement for the work done in the expansion and heat absorbed or released when 5 litres of an ideal gas at 10 atmospheric pressure isothermally expands into vacuum until volume is 15 litres :
- (1) Both the heat and work done will be greater than zero
  - (2) Heat absorbed will be less than zero and work done will be positive
  - (3) Work done will be zero and heat will also be zero
  - (4) Work done will be greater than zero and heat will remain zero

**Answer (3)**

65. The correct IUPAC name of the compound



- (1) 4-ethyl-1-fluoro-2-nitrobenzene
- (2) 4-ethyl-1-fluoro-6-nitrobenzene
- (3) 3-ethyl-6-fluoro-1-nitrobenzene
- (4) 1-ethyl-4-fluoro-3-nitrobenzene

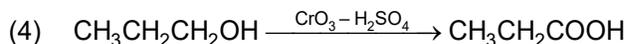
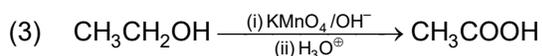
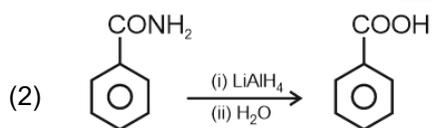
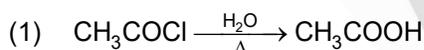
**Answer (1)**

66. Which of the following set of ions act as oxidising agents?

- (1)  $\text{Ce}^{4+}$  and  $\text{Tb}^{4+}$
- (2)  $\text{La}^{3+}$  and  $\text{Lu}^{3+}$
- (3)  $\text{Eu}^{2+}$  and  $\text{Yb}^{2+}$
- (4)  $\text{Eu}^{2+}$  and  $\text{Tb}^{4+}$

**Answer (1)**

67. Select the **incorrect** reaction among the following:



**Answer (2)**

68. The UV-visible absorption bands in the spectra of lanthanoid ions are 'X', probably because of the excitation of electrons involving 'Y'. The 'X' and 'Y', respectively, are :

- (1) Broad and f orbitals
- (2) Narrow and f orbitals
- (3) Broad and d and f orbitals
- (4) Narrow and d and f orbitals

**Answer (2)**

69. Ethylene diaminetetraacetate ion is a/an:
- (1) hexadentate ligand (2) ambidentate ligand  
(3) monodentate ligand (4) bidentate ligand

**Answer (1)**

70. The amount of glucose required to prepare 250 mL of  $\frac{M}{20}$  aqueous solution is :

(Molar mass of glucose :  $180 \text{ g mol}^{-1}$ )

- (1) 2.25 g (2) 4.5 g  
(3) 0.44 g (4) 1.125 g

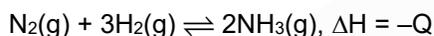
**Answer (1)**

71. Identify the **incorrect** statement from the following :

- (1) The acidic strength of HX (X = F, Cl, Br and I) follows the order : HF > HCl > HBr > HI.  
(2) Fluorine exhibits -1 oxidation state whereas other halogens exhibit +1, +3, +5 and +7 oxidation states also.  
(3) The enthalpy of dissociation of F<sub>2</sub> is smaller than that of Cl<sub>2</sub>.  
(4) Fluorine is stronger oxidising agent than chlorine.

**Answer (1)**

72. For the reaction in equilibrium

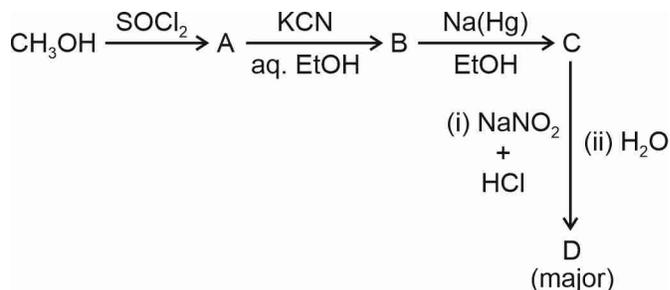


Reaction is favoured in forward direction by:

- (1) use of catalyst  
(2) decreasing concentration of N<sub>2</sub>  
(3) low pressure, high temperature and high concentration of ammonia  
(4) high pressure, low temperature and higher concentration of H<sub>2</sub>

**Answer (4)**

73. The major product D formed in the following reaction sequence is:



- (1)  $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \text{H}$  (2)  $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \text{NH}_2$   
(3) CH<sub>3</sub>CH<sub>2</sub>OH (4) CH<sub>3</sub>CH<sub>2</sub>Cl

**Answer (3)**



78. The compound that does not undergo Friedel-Crafts alkylation reaction but gives a positive carbylamine test is :

- (1) Aniline (2) Pyridine  
(3) N-methylaniline (4) Triethylamine

**Answer (1)**

79. For an endothermic reaction:

- (A)  $q_p$  is negative.  
(B)  $\Delta_r H$  is positive.  
(C)  $\Delta_r H$  is negative.  
(D)  $q_p$  is positive.

Choose the **correct** answer from the options given, below:

- (1) B and D (2) C and D  
(3) A and B (4) A and C

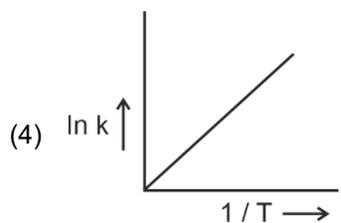
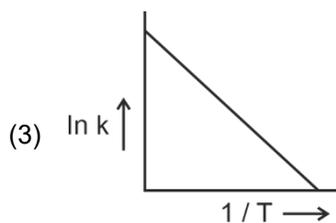
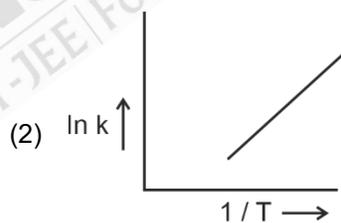
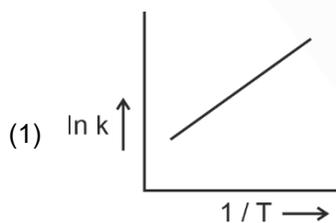
**Answer (1)**

80. 1.0 g of  $H_2$  has same number of molecules as in:

- (1) 14 g of  $N_2$  (2) 18 g of  $H_2O$   
(3) 16 g of  $CO$  (4) 28 g of  $N_2$

**Answer (1)**

81. Which of the following plot represents the variation of  $\ln k$  versus  $\frac{1}{T}$  in accordance with Arrhenius equation?



**Answer (3)**

82. A steam volatile organic compound which is immiscible with water has a boiling point of  $250^\circ C$ . During steam distillation, a mixture of this organic compound and water will boil :

- (1) above  $100^\circ C$  but below  $250^\circ C$   
(2) above  $250^\circ C$   
(3) at  $250^\circ C$   
(4) close to but below  $100^\circ C$

**Answer (4)**

83. Given below are two statements :

**Statement I** : Glycogen is similar to amylose in its structure.

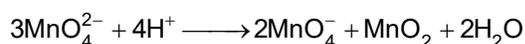
**Statement II** : Glycogen is found in yeast and fungi also.

In the light of the above statements, choose the **correct** answer from the options given below :

- (1) **Statement I** is true but **Statement II** is false.
- (2) **Statement I** is false but **Statement II** is true.
- (3) Both **Statement I** and **Statement II** are true.
- (4) Both **Statement I** and **Statement II** are false.

**Answer (2)**

84. The oxidation states **not** shown by Mn in given reaction is :



- A. +6
- B. +2
- C. +4
- D. +7
- E. +3

Choose the **most appropriate** answer from the options given below :

- |                  |                  |
|------------------|------------------|
| (1) D and E only | (2) B and D only |
| (3) A and B only | (4) B and E only |

**Answer (4)**

85. Given below are two statements:

**Statement I**: The Balmer spectral line for H atom with lowest energy is located at  $\frac{5}{36}R_H \text{ cm}^{-1}$ .

( $R_H$  = Rydberg constant)

**Statement II**: When the temperature of blackbody increases, the maxima of the curve (intensity of wavelength) shifts to shorter wavelength.

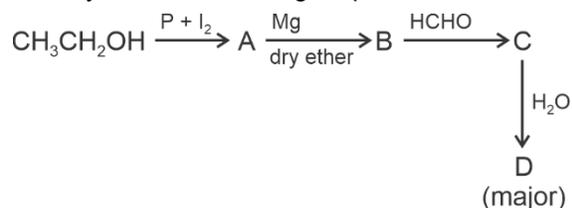
In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (3)**

**SECTION-B**

86. Identify D in the following sequence of reactions:



- (1) n-propyl alcohol (2) isopropyl alcohol  
(3) propanal (4) propionic acid

**Answer (1)**

87. Identify the **incorrect** statement.

- (1)  $\text{PEt}_3$  and  $\text{AsPh}_3$  as ligands can form  $d\pi-d\pi$  bond with transition metals  
(2) The N – N single bond is as strong as the P – P single bond  
(3) Nitrogen has unique ability to form  $p\pi-p\pi$  multiple bonds with nitrogen, carbon and oxygen  
(4) Nitrogen cannot form  $d\pi-p\pi$  bond as other heavier elements of its group

**Answer (2)**

88. Match **List-I** with **List-II** :

<b>List-I</b> (Test/reagent)	<b>List-II</b> (Radical identified)
A. Lake Test	I. $\text{NO}_3^-$
B. Nessler's Reagent	II. $\text{Fe}^{3+}$
C. Potassium sulphocyanide	III. $\text{Al}^{3+}$
D. Brown Ring Test	IV. $\text{NH}_4^+$

Choose the **correct** answer from the options given below :

- (1) A-IV, B-II, C-III, D-I (2) A-II, B-IV, C-III, D-I  
(3) A-II, B-III, C-IV, D-I (4) A-III, B-IV, C-II, D-I

**Answer (4)**

89. Match List-I with List-II:

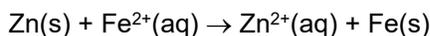
	<b>List-I</b> <b>Molecule</b>		<b>List-II</b> <b>Bond enthalpy (<math>\text{kJ mol}^{-1}</math>)</b>
A.	HCl	I.	435.8
B.	$\text{N}_2$	II.	498
C.	$\text{H}_2$	III.	946.0
D.	$\text{O}_2$	IV.	431.0

Choose the correct answer from the options given below:

- (1) A-III, B-IV, C-I, D-II (2) A-IV, B-I, C-III, D-II  
(3) A-IV, B-III, C-II, D-I (4) A-IV, B-III, C-I, D-II

**Answer (4)**

90. The standard cell potential of the following cell  $\text{Zn}|\text{Zn}^{2+}(\text{aq})||\text{Fe}^{2+}(\text{aq})|\text{Fe}$  is 0.32 V. Calculate the standard Gibbs energy change for the reaction :



(Given :  $1 \text{ F} = 96487 \text{ C}$ )

- (1)  $-61.75 \text{ kJ mol}^{-1}$  (2)  $+5.006 \text{ kJ mol}^{-1}$   
 (3)  $-5.006 \text{ kJ mol}^{-1}$  (4)  $+61.75 \text{ kJ mol}^{-1}$

**Answer (1)**

91. Match List-I with List-II:

List-I	List-II
<b>Solid salt treated with dil. <math>\text{H}_2\text{SO}_4</math></b>	<b>Anion detected</b>
A. effervescence of colourless gas	I. $\text{NO}_2^-$
B. gas with smell of rotten egg	II. $\text{CO}_3^{2-}$
C. gas with pungent smell	III. $\text{S}^{2-}$
D. brown fumes	IV. $\text{SO}_3^{2-}$

Choose the **correct** answer from the options given below:

- (1) A-II, B-III, C-IV, D-I (2) A-IV, B-III, C-II, D-I  
 (3) A-I, B-II, C-III, D-IV (4) A-II, B-III, C-I, D-IV

**Answer (1)**

92. The ratio of solubility of AgCl in 0.1 M KCl solution to the solubility of AgCl in water is:

(Given : Solubility product of AgCl =  $10^{-10}$ )

- (1)  $10^{-4}$  (2)  $10^{-6}$   
 (3)  $10^{-9}$  (4)  $10^{-5}$

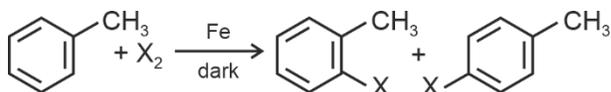
**Answer (1)**

93. On complete combustion, 0.3 g of an organic compound gave 0.2 g of  $\text{CO}_2$  and 0.1 g of  $\text{H}_2\text{O}$ . The percentage composition of carbon and hydrogen in the compound, respectively is:

- (1) 4.07% and 15.02% (2) 18.18% and 3.70%  
 (3) 15.02% and 4.07% (4) 3.70% and 18.18%

**Answer (2)**

94. The following reaction method



is not suitable for the preparation of the corresponding haloarene products, due to high reactivity of halogen, when X is :

- (1) F (2) I  
 (3) Cl (4) Br

**Answer (1)**



**BOTANY****SECTION-A**

101. The regions with high level of species richness, high degree of endemism and a loss of 70% of the species and habitat are identified as:

- (1) Natural Reserves
- (2) Sacred Groves
- (3) Biodiversity Hotspots
- (4) Biogeographical Regions

**Answer (3)**

102. Which of the following simple tissues are commonly found in the fruit walls of nuts and pulp of pear?

- (1) Sclereids
- (2) Fibres
- (3) Parenchyma
- (4) Collenchyma

**Answer (1)**

103. In a chromosome, there is a specific DNA sequence, responsible for initiating replication. It is called as:

- (1) Recognition sequence
- (2) Cloning site
- (3) Restriction site
- (4) *ori* site

**Answer (4)**

104. Given below are two statements:

**Statement I:** When many alleles of a single gene govern a character, it is called polygenic inheritance.

**Statement II:** In Polygenic inheritance, the effect of each allele is additive.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) Statement I is true but Statement II is false
- (2) Statement I is false but Statement II is true
- (3) Both Statement I and Statement II are true
- (4) Both Statement I and Statement II are false

**Answer (2)**

105. Which of the following are required for the light reaction of Photosynthesis?

- |                         |                 |
|-------------------------|-----------------|
| A. $\text{CO}_2$        | B. $\text{O}_2$ |
| C. $\text{H}_2\text{O}$ | D. Chlorophyll  |
| E. Light                |                 |

Choose the **correct** answer from the options given below:

- (1) A, C, D and E only
- (2) C, D and E only
- (3) A and B only
- (4) A, C and E only

**Answer (2)**

106. Match **List-I** with **List-II**:

<b>List-I</b>	<b>List-II</b>
A. Fleming	I. Disc shaped sacs or cisternae near cell nucleus
B. Robert Brown	II. Chromatin
C. George Palade	III. Ribosomes
D. Camillo Golgi	IV. Nucleus

Choose the **correct** answer from the options given below:

- (1) A-II, B-IV, C-III, D-I
- (2) A-II, B-III, C-I, D-IV
- (3) A-I, B-II, C-III, D-IV
- (4) A-IV, B-II, C-III, D-I

**Answer (1)**

107. Match **List-I** with **List-II**:

<b>List-I</b>	<b>List-II</b>
<b>Type of Inheritance</b>	<b>Example</b>
A. Incomplete dominance	I. Blood groups in human
B. Co-dominance	II. Flower colour in <i>Antirrhinum</i>
C. Pleiotropy	III. Skin colour in human
D. Polygenic inheritance	IV. Phenylketonuria

Choose the **correct** answer from the options given below:

- (1) A-III, B-IV, C-II, D-I
- (2) A-II, B-I, C-IV, D-III
- (3) A-II, B-III, C-I, D-IV
- (4) A-IV, B-I, C-III, D-II

**Answer (2)**

108. Which part of the ovule stores reserve food materials?

- (1) Nucellus
- (2) Integument
- (3) Placenta
- (4) Funicle

**Answer (1)**

109. Which one of the following is **not** found in Gymnosperms?

- (1) Sieve cells
- (2) Albuminous cells
- (3) Tracheids
- (4) Vessels

**Answer (4)**

110. Which one of the following is **not** included under *in-situ* conservation?

- (1) Wild-life sanctuary
- (2) Botanical garden
- (3) Biosphere reserve
- (4) National park

**Answer (2)**

111. Given below are two statements:

**Statement I** : The Indian Government has set up GEAC, which will make decisions regarding the validity of GM research.

**Statement II** : Biopiracy is the term used to refer to the use of bio-resources by native people.

In the light of the above statements, choose the **correct** answer from the options given below :

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (1)**

112. Pollen grains remain preserved as fossils due to the presence of :

- (1) Epidermal layer
- (2) Tapetum
- (3) Exine layer
- (4) Intine layer

**Answer (3)**

113. Identify the **incorrect** pair :

- (1) Sphenopsida – *Adiantum*
- (2) Pteropsida – *Dryopteris*
- (3) Psilopsida – *Psilotum*
- (4) Lycopsida – *Selaginella*

**Answer (1)**

114. Which of the following is the **correct** match?

- (1) Gymnosperms : *Cedrus, Pinus, Sequoia*
- (2) Angiosperms : *Wolffia, Eucalyptus, Sequoia*
- (3) Bryophytes : *Polytrichum, Polysiphonia, Sphagnum*
- (4) Pteridophytes : *Equisetum, Ginkgo, Adiantum*

**Answer (1)**

115. Given below are two statements regarding RNA polymerase in prokaryotes.

**Statement I** : In prokaryotes, RNA polymerase is capable of catalysing the process of elongation during transcription.

**Statement II** : RNA polymerase associate transiently with 'Rho' factor to initiate transcription.

In the light of the above statements, choose the **correct** answer from the options given below :

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (1)**

116. Which of the following is a nucleotide?

- (1) Uridine
- (2) Adenylic acid
- (3) Guanine
- (4) Guanosine

**Answer (2)**

117. Match **List-I** with **List-II** :

<b>List-I</b>	<b>List-II</b>
A. Vexillary aestivation	I. Brinjal
B. Epipetalous stamens	II. Peach
C. Epiphyllous stamens	III. Pea
D. Perigynous flower	IV. Lily

Choose the **correct** answer from the options given below :

- (1) A-III, B-I, C-IV, D-II
- (2) A-III, B-IV, C-I, D-II
- (3) A-III, B-II, C-I, D-IV
- (4) A-II, B-I, C-IV, D-III

**Answer (1)**

118. Match **List-I** with **List-II** :

<b>List-I</b>	<b>List-II</b>
A. China rose	I. Free central
B. Mustard	II. Basal
C. Primrose	III. Axile
D. Marigold	IV. Parietal

Choose the **correct** answer from the options given below :

- (1) A-IV, B-III, C-II, D-I
- (2) A-II, B-III, C-IV, D-I
- (3) A-III, B-IV, C-I, D-II
- (4) A-III, B-IV, C-II, D-I

**Answer (3)**

119. Which of the following helps in maintenance of the pressure gradient in sieve tubes?

- (1) Albuminous cells
- (2) Sieve cells
- (3) Phloem parenchyma
- (4) Companion cells

**Answer (4)**

120. Mesosome in a cell is a :

- (1) Membrane bound vesicular structure
- (2) Chain of many ribosomes attached to a single mRNA
- (3) Special structure formed by extension of plasma membrane
- (4) Medium sized chromosome

**Answer (3)**

121. Match **List-I** with **List-II** :

<b>List-I</b>	<b>List-II</b>
A. Abscisic acid	I. Promotes female flowers in cucumber
B. Ethylene	II. Helps seeds to withstand desiccation
C. Gibberellin	III. Helps in nutrient mobilisation
D. Cytokinin	IV. Promotes bolting in beet, cabbage etc

Choose the **correct** answer from the options given below:

- (1) A-II, B-III, C-IV, D-I
- (2) A-III, B-II, C-I, D-IV
- (3) A-II, B-I, C-IV, D-III
- (4) A-II, B-I, C-III, D-IV

**Answer (3)**

122. Match **List-I** with **List-II** :

<b>List-I</b>	<b>List-II</b>
A. Genetically engineered Human Insulin	I. Gene therapy
B. GM Cotton	II. <i>E. coli</i>
C. ADA Deficiency	III. Antigen-antibody interaction
D. ELISA	IV. <i>Bacillus thuringiensis</i>

Choose the **correct** answer from the options given below:

- (1) A-III, B-II, C-IV, D-I
- (2) A-II, B-I, C-IV, D-III
- (3) A-IV, B-III, C-I, D-II
- (4) A-II, B-IV, C-I, D-III

**Answer (4)**

123. Match **List-I** with **List-II**:

<b>List-I</b>	<b>List-II</b>
A. ETS Complex I	I. NADH Dehydrogenase
B. ETS Complex II	II. Cytochrome $bC_1$
C. ETS Complex III	III. Cytochrome C oxidase
D. ETS Complex IV	IV. Succinate Dehydrogenase

Choose the **correct** answer from the options given below :

- (1) A-IV, B-I, C-III, D-II
- (2) A-I, B-IV, C-II, D-III
- (3) A-III, B-I, C-IV, D-II
- (4) A-I, B-II, C-IV, D-III

**Answer (2)**

124. Cryopreservation technique is used for :

- (1) Protection of environment
- (2) Protection of Biodiversity hotspots
- (3) Preservation of gametes in viable and fertile condition for a long period
- (4) *In-situ* conservation

**Answer (3)**

125. Which of the following are **correct** about cellular respiration?
- Cellular respiration is the breaking of C-C bonds of complex organic molecules by oxidation.
  - The entire cellular respiration takes place in Mitochondria.
  - Fermentation takes place under anaerobic condition in germinating seeds.
  - The fate of pyruvate formed during glycolysis depends on the type of organism also.
  - Water is formed during respiration as a result of O<sub>2</sub> accepting electrons and getting reduced.

Choose the **correct** answer from the options given below:

- A, C, D, E only
- A, B, E only
- A, B, C, E only
- B, C, D, E only

**Answer (1)**

126. Given below are two statements:

**Statement I:** In eukaryotes there are three RNA polymerases in the nucleus in addition to the RNA polymerase found in the organelles.

**Statement II:** All the three RNA polymerases in eukaryotic nucleus have different roles.

In the light of the above statements, choose the **correct** answer from the options given below:

- Statement I** is correct but **Statement II** is incorrect
- Statement I** is incorrect but **Statement II** is correct
- Both **Statement I** and **Statement II** are correct
- Both **Statement I** and **Statement II** are incorrect

**Answer (3)**

127. Match **List-I** with **List-II**:

	List-I		List-II
A.	Histones	I.	Loosely packed chromatin
B.	Nucleosome	II.	Densely packed Chromatin
C.	Euchromatin	III.	Positively charged basic proteins
D.	Heterochromatin	IV.	DNA wrapped around histone octamer

Choose the **correct** answer from the options given below:

- A-IV, B-III, C-II, D-I
- A-III, B-I, C-IV, D-II
- A-II, B-III, C-IV, D-I
- A-III, B-IV, C-I, D-II

**Answer (4)**

128. Given below are two statements:

**Statement I:** Failure of segregation of chromatids during cell cycle resulting in the gain or loss of whole set of chromosome in an organism is known as aneuploidy.

**Statement II:** Failure of cytokinesis after anaphase stage of cell division results in the gain or loss of a chromosome is called polyploidy.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (4)**

129. Recombination between homologous chromosomes is completed by the end of

- (1) Diakinesis
- (2) Zygotene
- (3) Diplotene
- (4) Pachytene

**Answer (4)**

130. Match **List-I** with **List-II**:

	<b>List-I</b>		<b>List-II</b>
A.	Metacentric chromosome	I.	Chromosome has a terminal centromere
B.	Sub-metacentric chromosome	II.	Middle centromere forming two equal arms of chromosome
C.	Acrocentric chromosome	III.	Centromere is slightly away from the middle of chromosome resulting into two unequal arms
D.	Telocentric chromosome	IV.	Centromere is situated close to its end forming one extremely short and one very long arm

Choose the **correct** answer from the options given below:

- (1) A-II, B-I, C-IV, D-III
- (2) A-IV, B-I, C-II, D-III
- (3) A-I, B-II, C-III, D-IV
- (4) A-II, B-III, C-IV, D-I

**Answer (4)**

131. Ligases is a class of enzymes responsible for catalysing the linking together of two compounds.

Which of the following bonds is not catalysed by it?

- (1) C – C
- (2) P – O
- (3) C – O
- (4) C – N

**Answer (1)**

132. F. Skoog observed that callus proliferated from the internodal segments of tobacco stem when auxins was supplied with one of the following except :

- (1) Extract of Vascular tissues
- (2) Coconut milk
- (3) Absciscic acid
- (4) Yeast Extract

**Answer (3)**

133. Given below are some statements about plant growth regulators.

- A. All Gas are acidic in nature.
- B. Auxins are antagonists to Gas.
- C. Zeatin was isolated from coconut milk.
- D. Ethylene induces flowering in Mango.
- E. Absciscic acid induces parthenocarpy.

Choose the correct set of statements from the option given below:

- (1) A, C, D
- (2) B, E
- (3) A, B, C
- (4) B, D, E

**Answer (1)**

134. Identify the **incorrect** statement related to get electrophoresis.

- (1) Separated DNA fragments can be directly seen under UV radiation
- (2) Separated DNA can be extracted from get piece
- (3) Fragment of DNA moves toward anode
- (4) Sieving effect of agarose gel helps in separation of DNA fragments

**Answer (1)**

135. Which of the following examples show monocarpellary, unilocular ovary with many ovules?

- A. *Sesbania*
- B. Brinjal
- C. *Indigofera*
- D. Tobacco
- E. *Asparagus*

Choose the correct answer from the options given below :

- (1) B and E only
- (2) C, D and E only
- (3) A, B and D only
- (4) A and C only

**Answer (4)**

### SECTION-B

136. Given below are two statements :

**Statement I:** In the *lac* operon, the *z* gene codes for beta-galactosidase which is primarily responsible for the hydrolysis of lactose into galactose and glucose.

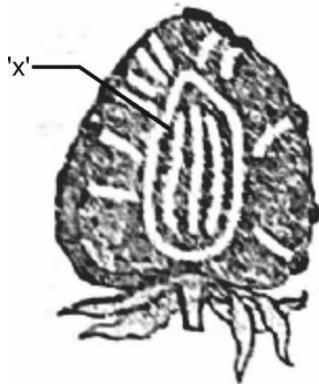
**Statement II:** In addition to lactose, glucose or galactose can also induce *lac* operon.

In the light of the above statements, choose the **correct** answer from the options given below :

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (1)**

137. The part marked as 'x' in the given figure is



- (1) Endosperm
- (2) Thalamus
- (3) Endocarp
- (4) Mesocarp

**Answer (2)**

138. Given below are two statements:

**Statement I:** In a dicotyledonous leaf, the adaxial epidermis generally bears more stomata than the abaxial epidermis.

**Statement II:** In a dicotyledonous leaf, the adaxially placed palisade parenchyma is made up of elongated cells, which are arranged vertically and parallel to each other.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **Statement I** is true but **Statement II** is false
- (2) **Statement I** is false but **Statement II** is true
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (2)**

139. Which of the following are **not** fatty acids?

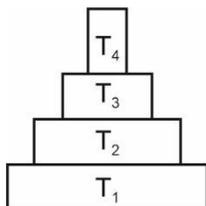
- A. Glutamic acid
- B. Arachidonic acid
- C. Palmitic acid
- D. Lecithin
- E. Aspartic acid

Choose the **correct** answer from the options given below :

- (1) C, D and E only
- (2) A and B only
- (3) A, D and E only
- (4) B and C only

**Answer (3)**

140. Consider the pyramid of energy of an ecosystem given below:



If  $T_4$  is equivalent to 1000 J, what is the value at  $T_1$

- (1)  $\frac{10000}{10}$  J
- (2)  $\frac{10000}{10} \times 4$  J
- (3) 10,000 J
- (4) 10,00,000 J

**Answer (4)**

141. Which one of the following products diffuses out of the chloroplast during photosynthesis?

- (1) ADP
- (2) NADPH
- (3) O<sub>2</sub>
- (4) ATP

**Answer (3)**

142. Recombinant DNA molecule can be created normally by cutting the vector DNA and source DNA respectively with:

- (1) Hind II, Hind II
- (2) Hind II, Alu I
- (3) Hind II, EcoR I
- (4) Hind II, BamHI

**Answer (1)**

143. Which one of the following is not a limitation of ecological pyramids?

- (1) Saprophytes are not given any place of ecological pyramids
- (2) It assumes a simple food chain, that almost never exists in nature
- (3) It accommodates a food web
- (4) It does not take into account the same species belonging to two or more trophic levels

**Answer (3)**

144. The *Bt* toxin in genetically engineered *Bt* cotton kills the pest by:

- (1) Creating pores in the midgut
- (2) Damaging the respiratory system
- (3) Degenerating the nervous system
- (4) Altering the pH of body fluids

**Answer (1)**

145. Match List-I with List-II:

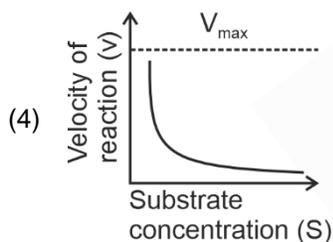
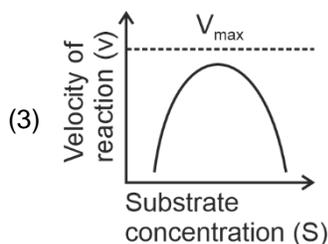
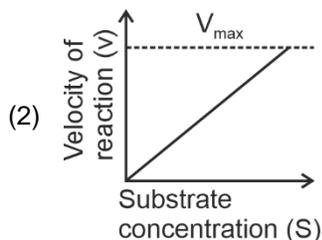
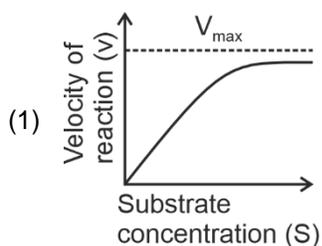
List-I Organisms	List-II Mode of Nutrition
A. Euglenoid	I. Parasitic
B. Dinoflagellate	II. Saprophytic
C. Slime mould	III. Photosynthetic
D. <i>Plasmodium</i>	IV. Switching between photosynthetic and heterotrophic mode

Choose the **correct** answer from the options given below:

- (1) A-III, B-IV, C-II, D-I
- (2) A-IV, B-II, C-I, D-III
- (3) A-IV, B-III, C-II, D-I
- (4) A-IV, B-II, C-III, D-I

**Answer (3)**

146. Which of the following graphs depicts the effect of substrate concentration on velocity of enzyme catalysed reaction?



**Answer (1)**

147. When will the population density increase, under special conditions?

When the number of :

- (1) Deaths exceeds number of births and also number of emigrants equals number of immigrants.
- (2) Births plus number of immigrants equals number of deaths plus number of emigrants.
- (3) Births plus number of emigrants is more than the number of deaths plus number of immigrants.
- (4) Births plus number of immigrants is more than the sum of number of deaths and number of emigrants.

**Answer (4)**

148. When a tall pea plant with round seeds was selfed, it produced the progeny of :

- (a) Tall plants with round seeds and
- (b) Tall plants with wrinkled seeds.

Identify the genotype of the parent plant.

- (1) TtRr
- (2) TtRR
- (3) TTRR
- (4) TTRr

**Answer (4)**

149. Match **List-I** with **List-II**:

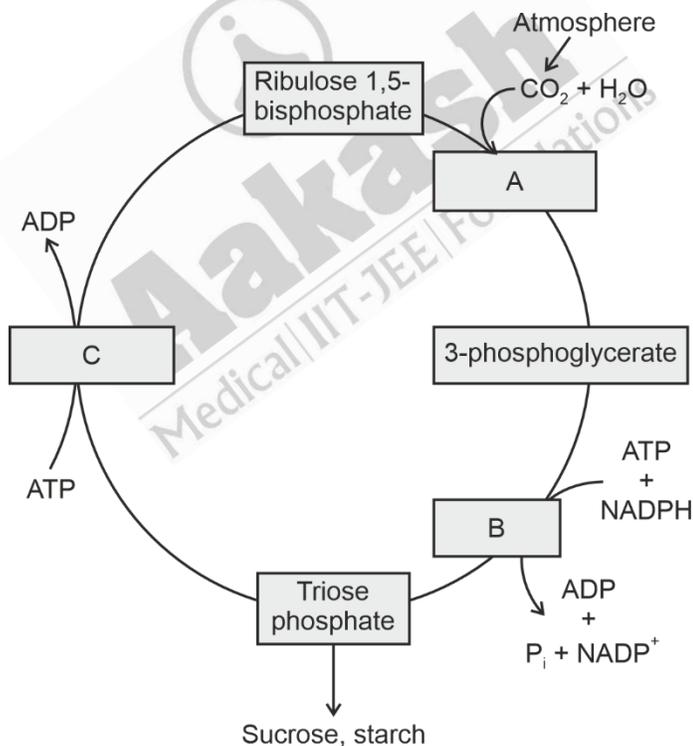
	<b>List-I</b>		<b>List-II</b>
A.	Biodiversity hotspot	I.	Khasi and jantia hills in Meghalaya
B.	Sacred groves	II.	World Summit on Sustainable
C.	Johannesburg South Africa	III.	Parthenium
D.	Alien species invasion	IV.	Western Ghats

Choose the **correct** answer from the options given below:

- (1) A-IV, B-I, C-II, D-III
- (2) A-II, B-III, C-IV, D-I
- (3) A-I, B-IV, C-III, D-II
- (4) A-III, B-I, C-II, D-IV

**Answer (1)**

150. Observe the given figure. Identify the different stages labelled with alphabets by selecting the **correct** option.



- (1) A-Carboxylation, B-Regeneration, C-Reduction
- (2) A-Reduction, B-Decarboxylation, C-Regeneration
- (3) A-Carboxylation, B-Reduction, C-Regeneration
- (4) A-Reduction, B-Carboxylation, C-Regeneration

**Answer (3)**







161. Which of the following statements is **correct** about the type of junction and their role in our body?
- (1) Adhering junctions facilitate the cells to communicate with each other.
  - (2) Tight junctions help to stop substances from leaking across a tissue.
  - (3) Tight junctions help to perform cementing to keep neighbouring cells together.
  - (4) Gap junctions help to create gap between the cells and tissues.

**Answer (2)**

162. Select the restriction endonuclease enzymes whose restriction sites are present for the tetracycline resistance ( $tet^R$ ) gene in the pBR322 cloning vector.
- (1) Bam HI and Sal I
  - (2) Sal I and Pst I
  - (3) Pst I and Pvu I
  - (4) Pvu I and Bam HI

**Answer (1)**

163. Match List-I with List-II.

	List-I		List-II
A.	Chondrichthyes	I.	<i>Clarias</i>
B.	Cyclostomata	II.	<i>Carcharodon</i>
C.	Osteichthyes	III.	<i>Myxine</i>
D.	Amphibia	IV.	<i>Ichthyophis</i>

Choose the **correct** answer from the options given below:

- (1) A-II, B-IV, C-I, D-III
- (2) A-I, B-III C-II, D-IV
- (3) A-II, B-III, C-I, D-IV
- (4) A-I, B-II, C-III, D-IV

**Answer (3)**

164. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

**Assertion A:** During menstrual cycle, the ovulation takes place approximately on 14<sup>th</sup> day.

**Reason R:** Rapid secretion of LH in the middle of menstrual cycle induces rupture of Graafian follicle and thereby the release of ovum.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (1) A is correct but R is not correct.
- (2) A is not correct but R is correct.
- (3) Both A and R are correct and R is the correct explanation of A.
- (4) Both A and R are correct but R is NOT the correct explanation of A.

**Answer (3)**





171. Given below are two statements:

Statement I: Antibiotics are chemicals produced by microbes that kill other microbes.

Statement II: Antibodies are chemicals formed in body that eliminate microbes.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (1) Statement I is correct but Statement II is incorrect
- (2) Statement I is incorrect but Statement II is correct
- (3) Both Statement I and Statement II are correct
- (4) Both Statement I and Statement II are incorrect

**Answer (3)**

172. Arrange the following parts in human Mammary gland, traversing the route of milk ejection.

- |                     |                     |
|---------------------|---------------------|
| A. Mammary duct     | B. Lactiferous duct |
| C. Mammary alveolus | D. Ampulla          |
| E. Mammary tubule   |                     |

Choose the correct answer from the options given below:

- |                       |                       |
|-----------------------|-----------------------|
| (1) D → C → E → A → B | (2) C → E → B → A → D |
| (3) C → E → A → D → B | (4) A → C → E → D → B |

**Answer (3)**

173. Which of the following are correct about EcoR1?

- A. Cut the DNA with blunt end
- B. Cut the DNA with sticky end
- C. Recognise a specific palindromic sequence
- D. Cut the DNA between the base G and A when encounters the DNA sequence 'GAATTC'
- E. Exonuclease

Choose the correct answer from the options given below:

- |                  |                  |
|------------------|------------------|
| (1) B, C, E only | (2) A, D, E only |
| (3) A, C, D only | (4) B, C, D only |

**Answer (4)**

174. Which of the following is/are present in female cockroach?

- |                     |                   |
|---------------------|-------------------|
| A. Collateral gland | B. Mushroom gland |
| C. Spermatheca      | D. Anal style     |
| E. Phallic gland    |                   |

Choose the most appropriate answer from the options given below:

- |                  |                  |
|------------------|------------------|
| (1) B and D only | (2) B and E only |
| (3) A only       | (4) A and C only |

**Answer (4)**





182. Diuresis is prevented by:
- (1) Renin from JG cell via switching off the osmoreceptors
  - (2) ANF from adrenal medulla
  - (3) Aldosterone from adrenal medulla
  - (4) Vasopressin from Neurohypophysis

**Answer (4)**

183. Following is the list of STD's. Select the discases which are not completely curable.

A.	Genital warts	B.	Genital herpes
C.	Syphilis	D.	Hepatus-B
E.	Trichomoniasis		

Choose the correct answer from the options given below:

- (1) A and D only
- (2) B and D only
- (3) A and C only
- (4) D and E only

**Answer (2)**

184. What is the correct order (old to recent) of periods in Paleozoic era?

- (1) Silurian, Devonian, Permian, Carboniferous
- (2) Silurian, Devonian, Carboniferous, Permian
- (3) Permian, Devonian, Silurian, Carboniferous
- (4) Silurian, Carboniferous, Permian, Devonian

**Answer (2)**

185. 'Lub' sound of Heart is caused by the \_\_\_\_\_.

- (1) closure of the semilunar values
- (2) opening of tricuspid and bicuspid values
- (3) opening of the semilunar valves
- (4) closure of the tricuspid and bicuspid valves

**Answer (4)**

## SECTION-B

186. Match List-I with List-II relating to human female external genitalia.

	List I (Structures)		List II (Features)
A.	Mons pubis	I.	A fleshy fold of tissue surrounding the vaginal opening
B.	Clitoris	II.	Fatty cushion of cells covered by skin and hair
C.	Hymen	III.	Tiny finger-like structure above labia minora
D.	Labina majora	IV.	A thin membrane-like structure covering vaginal opening

Choose the correct answer from the option given below :

- (1) A-II, B-III, C-IV, D-I
- (2) A-IV, B-III, C-II, D-I
- (3) A-I, B-IV, C-III, D-II
- (4) A-II, B-III, C-I, D-IV

**Answer (1)**

187. Aneuploidy is a chromosomal disorder where chromosome number is not the exact copy of its haploid set of chromosomes, due to :

- A. Substitution
- B. Addition
- C. Deletion
- D. Translocation
- E. Inversion

Choose the **most appropriate** answer from the options given below :

- (1) C and D only
- (2) D and E only
- (3) A and B only
- (4) B and C only

**Answer (4)**

188. Given below are two statements :

**Statement I** : RNA interference takes place in all Eukaryotic organisms as method of cellular defense.

**Statement II** : RNAi involves the silencing of a specific mRNA due to a complementary single-stranded RNA molecule that binds and prevents translation of mRNA

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) **Statement I** is true but **Statement II** is false.
- (2) **Statement I** is false but **Statement II** is true.
- (3) Both **Statement I** and **Statement II** are true.
- (4) Both **Statement I** and **Statement II** are false.

**Answer (1)**

189. Identify the wrong statements :

- A. Erythropoietin is produced by juxtaglomerular cells of the kidney
- B. Leydig cells produce Androgens
- C. Atrial Natriuretic factor, a peptide hormone is secreted by the seminiferous tubules of the testes
- D. Cholecystokinin is produced by gastrointestinal tract
- E. Gastrin acts on intestinal wall and helps in the production of pepsinogen

Choose the **most appropriate** answer from the options given below :

- (1) D and E only
- (2) A and B only
- (3) C and E only
- (4) A and C only

**Answer (3)**

190. Following are the steps involved in the process of PCR.

- A. Annealing
- B. Amplification (~1 billion times)
- C. Denaturation
- D. Treatment with Taq polymerase and deoxynucleotides
- E. Extension

Choose the correct sequence of steps of PCR from the options given below :

- (1) C → A → D → E → B
- (2) A → B → E → D → C
- (3) A → C → E → D → B
- (4) D → B → E → C → A

**Answer (1)**

191. Given below are two statements:

**Statements I:** Concentrated urine is formed due to counter current mechanism in nephron.

**Statement II:** Counter current mechanism helps to maintain osmotic gradient in the medullary interstitium.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (1) **Statement I** is correct but **Statement II** is incorrect.
- (2) **Statement I** is incorrect but **Statement II** is correct.
- (3) Both **Statement I** and **Statement II** are correct.
- (4) Both **Statement I** and **Statement II** are incorrect.

**Answer (3)**

192. Given below are two statements:

**Statement I:** Concentrically arranged cisternae of Golgi complex are arranged near the nucleus with distinct convex *cis* or maturing and concave *trans* or forming face.

**Statement II:** A number of proteins are modified in the cisternae of Golgi complex before they are released from *cis* face.

In the light of the above statements, choose the **correct** answer from the option given below.

- (1) **Statement I** is true but **Statement II** is false.
- (2) **Statement I** is false but **Statement II** is true.
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false

**Answer (4)**

193. Match **List-I** with **List-II**:

- | <b>List-I</b>  | <b>List-II</b>                            |
|----------------|---|
| A. Parturition | I. Several antibodies for new-born babies |
| B. Placenta    | II. Collection of ovum after ovulation    |
| C. Colostrum   | III. Foetal ejection reflex               |
| D. Fimbriae    | IV. Secretion of the hormone hCG          |

Choose the correct answer from the option given below:

- (1) A-III, B-IV, C-I, D-II
- (2) A-I, B-IV, C-II, D-III
- (3) A-II, B-III, C-IV, D-I
- (4) A-III, B-IV, C-II, D-I

**Answer (1)**

194. Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.  
**Assertion A:** Members of subphylum vertebrates possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult.

**Reason R:** Thus all chordates are vertebrates not all vertebrates are chordates.

In the light of the above statements choose the correct answer from the option given below.

- (1) **A** is true but **R** is false.
- (2) **A** is false but **R** is true
- (3) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (4) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

**Answer (1)**

195. The mother has A+ blood group the father has B+ and the child is A+. What can be the possibility of genotypes of all three, respectively?

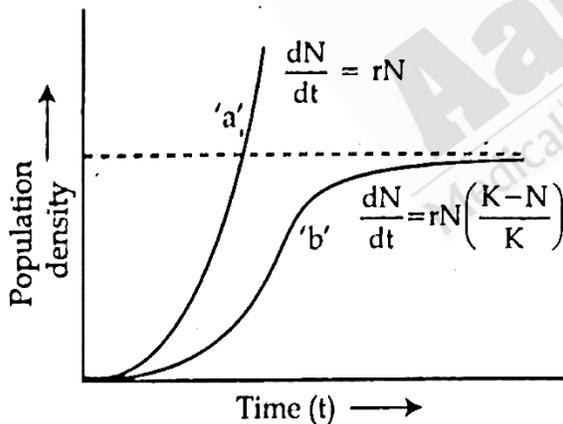
- |                                |                                |
|--------------------------------|--------------------------------|
| A. $I^A I^A   I^B i   I^B i$   | B. $I^A I^A   I^B i   I^A i$   |
| C. $I^B i   I^A I^A   I^A I^B$ | D. $I^A I^A   I^B I^B   I^A i$ |
| E. $I^A i   I^B i   I^A i$     |                                |

Choose the **correct** answer from the option given below:

- |             |             |
|-------------|-------------|
| (1) C and D | (2) D and A |
| (3) A and B | (4) B and E |

**Answer (4)**

196. What do 'a' and 'b' represent in the following population growth curve?



- (1) 'a' represents exponential growth when responses are not limiting the growth; and 'b' represents logistic growth when responses are limiting the growth.
- (2) 'a' represents logistic growth when responses are not limiting the growth; 'b' represents exponential growth when responses are limiting the growth.
- (3) 'a' represents carrying capacity and 'b' shows logistic growth when responses are limiting the growth.
- (4) 'a' represents exponential growth when responses are not limiting the growth and 'b' shows carrying capacity.

**Answer (1)**

197. Select the correct statements regarding mechanism of muscle contraction.
- It is initiated by a signal sent by CNS via sensory neuron.
  - Neurotransmitter generates action potential in the sarcolemma.
  - Increased  $\text{Ca}^{++}$  level leads to the binding of calcium with troponin on action filaments.
  - Masking of active site for actin is activated.
  - Utilising the energy from ATP hydrolysis to form cross bridge.

Choose the most appropriate answer from the options given below:

- B, C and E only
- C, D and E only
- A and D only
- B, D and E only

**Answer (1)**

198. Match List I with List II :

	List - I		List - II
A.	Squamous Epithelium	I.	Goblet cells of alimentary canal
B.	Ciliated Epithelium	II.	Inner lining of pancreatic ducts
C.	Glandular Epithelium	III.	Walls of blood vessels
D.	Compound Epithelium	IV.	Inner surface of Fallopian tubes

Choose the correct answer from the options given below :

- A-II, B-III, C-I, D-IV
- A-II, B-IV, C-III, D-I
- A-III, B-I, C-II, D-IV
- A-III, B-IV, C-I, D-II

**Answer (4)**

199. Match List I with List II :

	List - I		List - II
A.	B-Lymphocytes	I.	Passive immunity
B.	Interferons	II.	Cell mediated immunity
C.	T-Lymphocytes	III.	Produce an army of proteins in response to pathogens
D.	Colostrum	IV.	Innate immunity

Choose the correct answer from the options given below :

- A-I, B-IV, C-II, D-III
- A-IV, B-II, C-III, D-I
- A-III, B-IV, C-II, D-I
- A-II, B-IV, C-I, D-III

**Answer (3)**

200. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

**Assertion A:** During the transportation of gases, about 20-25 percent of  $\text{CO}_2$  is carried by Haemoglobin as carbamino-haemoglobin.

**Reason R:** This binding is related to high  $\text{pCO}_2$  and low  $\text{pO}_2$  in tissues.

In the light of the above statements, choose the correct answer from the options given below.

- (1) A is true but R is false.
- (2) A is false but R is true.
- (3) Both A and R are true and R is the correct explanation of A.
- (4) Both A and R are true but R is NOT the correct explanation of A.

**Answer (3)**

